

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): An antimicrobial organic polymer material comprising an organic polymer ~~material~~ having a polymer side chain containing ~~unit derived from an~~ one or more polymerized N-alkyl-N-vinylalkylamide monomer units ~~on a backbone bonded to the backbone of the~~ of a organic polymer substrate and triiodide ion, wherein the triiodide ion is carried on said organic polymer ~~material~~.

Claim 2 (Currently Amended): The antimicrobial organic polymer material of Claim 1 wherein the polymer side chain ~~containing a unit derived from an N-alkyl N-vinylalkylamide~~ has been introduced onto ~~a backbone of a~~ the backbone of the organic polymer substrate by radiation-induced graft polymerization.

Claim 3 (Currently Amended): The antimicrobial organic polymer material of Claim 1 wherein the ~~unit derived from an N-alkyl N-vinylalkylamide~~ side chain comprises ~~is derived from~~ one or more polymerizable polymerized monomers selected from the group consisting of N-vinylpyrrolidone, 1-vinyl-2-piperidone, N-vinyl-N-methylacetamide, N-vinyl-N-ethylacetamide, N-vinyl-N-methyl propylamide, N-vinyl-N-ethyl propylamide and derivatives thereof.

Claim 4 (Currently Amended): The antimicrobial organic polymer material of Claim 1 wherein the organic polymer substrate ~~is composed of~~ comprises a polyolefin-based organic polymer.

Claim 5 (Currently Amended): The antimicrobial organic polymer material of Claim 1 in the form selected from the group consisting of a fiber, a woven/nonwoven fabric which is a fiber assembly, ~~and processed products thereof~~ of the woven/nonwoven fabric, fiber chips, beads, nets, films, plate members and bulk members.

Claim 6 (Previously Presented): An antimicrobial filter comprising the antimicrobial organic polymer material of Claim 1.

Claim 7 (Currently Amended): A process for preparing an antimicrobial organic polymer material, comprising

introducing a polymer side chain containing ~~a unit derived from an~~ one or more polymerized N-alkyl-N-vinylalkylamide monomer units onto a the backbone of an organic polymer ~~substrate~~ to form an organic polymer material; and

loading triiodide ion on the ~~resulting~~ organic polymer material.

Claim 8 (Currently Amended): The process of Claim 7 wherein the polymer side chain ~~containing a unit derived from an N-alkyl N-vinylalkylamide~~ is formed by graft-polymerizing a polymerizable monomer containing an N-alkyl-N-vinylalkylamide onto a the backbone of a an organic polymer ~~substrate via~~ by radiation-induced graft polymerization.

Claim 9 (New): The antimicrobial organic polymer material of Claim 1, wherein the organic polymer is a polyethylene polymer.

Claim 10 (New): The antimicrobial organic polymer material of Claim 1, wherein the side chain comprises one or more polymerized N-vinyl pyrrolidone monomers.

Claim 11 (New): The process as claimed in Claim 7, wherein the triiodide ion is loaded on the organic polymer material by immersing the organic polymer material in at least one of an aqueous iodine/potassium iodide solution or an aqueous iodine/hydrogen iodide solution.

Claim 12 (New): The process as claimed in Claim 7, wherein the triiodide ion is loaded onto the organic polymer material by passing a solution of at least one of aqueous iodine/potassium iodide or aqueous iodine/hydrogen iodide through a filter made of the organic polymer material.

Claim 13 (New): The process of Claim 7, wherein the triiodide ion is loaded on the organic polymer material by contacting the polymer material with iodine vapor.

Claim 14 (New): The process of Claim 7, wherein the triiodide ion is loaded on the organic polymer material by immersing the polymer material in a solution of iodine dissolved in an organic solvent.

Claim 15 (New): The process as claimed in Claim 14, wherein the organic solvent is at least one selected from the group consisting of dichloromethane, chloroform, and methanol.

Claim 16 (New): The process as claimed in Claim 14, further comprising:  
adding hydroiodic acid to the solution.

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Claim 17 (New): The antimicrobial organic polymer material of Claim 1, wherein the triiodide ion is present in an amount of from 1 to 30% per unit weight of the organic polymer.

BASIS FOR THE AMENDMENT

Claims 1-17 are active in the present application. Claims 1-8 have been addend for clarity. The amendment for clarity is not intended to further limit the originally claimed subject matter. Claims 9-17 are new claims. Support for new Claim 9 is found on page 14, line 28. Support for new Claim 10 is found on page 15, line 3. Support for new Claim 12-17 is found on page 8, lines 2-21. No new matter is believed to have been added by this amendment.

REQUEST FOR RECONSIDERATION

Applicants thank Examiner Fubara for the helpful and courteous discussion of October 21, 2003. Applicants further thank the Examiner for indicating that the subject matter of original Claim 8 is allowable. During the discussion, Applicants' U.S. representative described the structure of the organic polymer having side chains attached to the backbone of the polymer. Applicants' U.S. representative argued that none of the prior art references of record disclose such a graft polymer structure.

The presently claimed antimicrobial organic polymer material contains an organic polymer having a backbone to which polymer side chains that contain a polymerized N-alkyl N-vinylalkylamide monomer unit (NVA) are bonded. NVA-containing copolymers may be useful for preparing articles or surfaces that have an antimicrobial character and may be able to accept triiodide ion. The iodine has high antiseptic activity (page 2, line 1-2).

When a monomer unit such as a vinyl alkylamide is added to a polymer backbone the physical properties of the polymer may be sacrificed (page 3, line 11 through page 4, line 8). This phenomena is known in the art wherein it has been demonstrated that it is necessary to crosslink specialty monomer-functionalized polymers so that the resulting functionalized polymer is able to maintain desirable physical and chemical characteristics as well as exhibit the iodine-carrying characteristics imparted to it by the specialty monomer unit.

In the presently claimed invention an NVA monomer unit-containing polymer group side chain is connected to a polymer backbone. The placement of the polymerized NVA monomer unit in a side chain rather than in the backbone allows the polymeric material to maintain its desirable physical properties without substantially negatively affecting the ability of the organic polymer to absorb triiodide ion.

The presently claimed invention was rejected under 35 U.S.C. § 102(b) in view of patents to Greff (U.S. 5,684,042) and Smith (WO 85/02422). Applicants traverse the

rejections on the grounds that the prior art references relied upon by the Examiner do not disclose or suggest an organic polymer having a backbone to which is bonded copolymer side chains which contain polymerized N-alkyl-N-vinylalkylamide monomer units.

Greff discloses cyanoacrylate compositions that contain an antimicrobially effective amount of a compatible iodine-containing antimicrobial agent (column 3, lines 62-63). The compatible iodine-containing antimicrobial agent is disclosed to comprise an antimicrobial complex of iodine molecules with a biocompatible polymer (column 4, lines 8-10). The biocompatible polymer is further described as, for example, a polyvinyl pyrrolidone polymer (e.g., PVP) (column 4, lines 8-14).

The cyanoacrylate ester present in the prior art composition is polymerized in the presence of water vapor or tissue protein whereby the cyanoacrylate may bond to human skin tissue (column 5, lines 43-46). The cyanoacrylate esters are present for the purpose of forming a polymer with human skin or tissue. Greff is silent to the presence of a polymeric material that contains side chains containing N-alkyl-N-vinylalkylamide monomer units. Greff therefore does not disclose an element of the presently-claimed invention, namely an organic polymer having side chains containing polymerized N-alkyl-N-vinylalkylamide monomer units.

Since Greff does not disclose one of the present claim limitations, the reference cannot anticipate or render obvious the presently claimed invention. Applicants respectfully request the withdrawal of the rejection.

The Office further rejected Claims 1-3 and 5-7 as anticipated in view of a reference to Smith (WO 85/02422). Applicants traverse the rejection on the grounds that the Smith publication does not disclose or suggest at least one element required in the claimed invention.

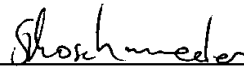
Smith describes an alloy fiber (page 1, line 5). The alloy fiber consists essentially of a fiber-forming component and an alloying component that is capable of complexing an anti-microbial agent such as iodine (page 2, lines 7-10). The alloying component is disclosed in the paragraph bridging pages 4 and 5. A preferred material is polyvinyl pyrrolidone. Copolymers of polyvinyl pyrrolidone are also disclosed at page 5, lines 2-20. However, Smith is silent to the inclusion of an organic polymer having a backbone bonded to polymerized N-alkyl-N-vinylalkylamide monomer units as side chains.

Smith does not disclose one of the present claim limitations, namely the organic polymer having side chains which contains polymerized N-alkyl-N-vinylalkylamide units on the organic polymer backbone. Therefore Smith cannot anticipate or render obvious the presently claimed invention.

Applicants respectfully request the withdrawal of the rejection.

Respectfully submitted,

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